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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,739

06/06/2006

Stefan Schneweis

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ALEXANDRIA, VA 22314

EXAMINER

MILLER, MICHAEL G

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

03/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,739	<b>Applicant(s)</b> SCHNEWEIS, STEFAN	
	<b>Examiner</b> MICHAEL G. MILLER	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

- 1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10 FEB 2009 has been entered.

### ***Response to Amendment***

- 2) Examiner notes the amendment filed 10 FEB 2009. The amendment introduces no new matter and is therefore accepted. As a result of the amendment, Claim 15 is amended.

### ***Response to Arguments***

- 3) Applicant's arguments filed 24 FEB 2009 have been fully considered but they are not persuasive.
- 4) Applicant argues that the teachings of Delperier must produce a gas impermeable substrate. Examiner respectfully disagrees. Both Applicant and Examiner agree that the process of Delperier provides at least a substrate with densified top and bottom surfaces. The citations of Applicant speak to Delperier's intent of ensuring

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that densification is uniform where it is undertaken. However, the flow pattern of the gas (see any of Figures 1, 3, 5, 7 and 11) is oblique and generally parallel to the surfaces of the part being densified. If the densifying gas is being applied from a source external to the part to be densified, the densification will inherently begin at the point of first contact between the gas and the part - in this case, the exterior surface. To ensure penetration of the gas into the part, a person of ordinary skill in the art at the time the invention was made would have aimed the densifying gas into the part; the teaching of sweeping the gas across the part is evidence of a desire to localize the densification process, as is the teaching of protecting the endcaps of the parts to be densified.

- 5) Applicant argues that the product formed by Delperier and Valentian does not contain pore channels through which gas can flow. Examiner maintains the position that since the endcaps are not densified, gas is able to freely flow between the densified upper and lower surfaces of the substrate. Examiner notes that Applicant has never defined a pore orientation in the claims.
- 6) Examiner maintains all grounds of rejection presented in the previous office action.

### ***Claim Rejections - 35 USC § 102***

- 7) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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- 8) Claims 15-19 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Delperier et al (U.S. PGPub 2002/0076491, hereinafter '491).
- 9) With regard to Claim 15, '491 teaches a method for producing a substrate designed to support an object for processing wherein carbon is used as the material for the substrate, and pore channels are formed, interspersed through the substrate, characterized by the following process steps:
  - a) Production of a framework made of carbon and/or SiC fibers (PG0040 teaches a method of making substrates from carbon fibers) and
  - b) Stabilization of the framework with a pyrocarbon coating that forms a matrix, such that the stabilized framework has a porosity level that forms the gas outlet or passage openings (PG0086 teaches pyrolytic carbon impregnation; Figures 9, 10, 12 and 13 show that porosity of the substrate is maintained after densification, note the dark spaces exterior to the brighter reflective rings of carbon),
  - c) A framework stabilized in this manner, or a segment of the framework, being used as the substrate (PG0003 teaches that these preforms can be used as supports for crucibles to process semiconductor wafers, which makes it a substrate designed to support an object for processing; a crucible is an object for processing).
- 10) With regard to Claim 16, '491 teaches a method according to claim 15, characterized in that:
  - a) The fibers are stabilized by means of vapor infiltration (CVI) (PG0085-0088).

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11)With regard to Claim 17, '491 teaches a method according to claim 15, characterized in that:

- a) Stabilized felt or non-woven materials, or Stabilized fabric layers are used as the framework (PG0085; carbon fiber plies consolidated in a resin).

12)With regard to Claim 18, '491 teaches a method according to claim 15, characterized in that:

- a) The fibers are stabilized exclusively with carbon (PG0086, pyrolitic carbon).

13)With regard to Claim 19, '491 teaches a method according to claim 15, characterized in that:

- a) The fibers are stabilized with a series of one coating made of carbon (PG0085 – 0088; a series of one coating made of carbon is used to stabilize the fibers).

14)With regard to Claim 22, '491 teaches a method according to claim 15, characterized in that:

- a) The stabilized framework has at least one planar surface (PG 0003; the paragraph cites cylindrical shapes with one closed end, and the closed end of a cylinder is a planar surface).

### ***Claim Rejections - 35 USC § 103***

15)The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

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skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16)The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- (1) Determining the scope and contents of the prior art.
- (2) Ascertaining the differences between the prior art and the claims at issue.
- (3) Resolving the level of ordinary skill in the pertinent art.
- (4) Considering objective evidence present in the application indicating obviousness or nonobviousness.

17)Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over '491 as applied to claim 15 above, and further in view of Valentian (U.S. Patent 5,132,145, hereinafter '145) and Carroll et al (5,397,595, hereinafter '595).

18)With regard to Claim 20, '491 teaches a method according to claim 15, except for the following limitation:

- a) The fibers are stabilized with a graduated system of coatings that transitions from carbon to silicon carbide.
- b) '491 teaches forming of a carbon coating before the deposition of pyrolytic carbon (PG0085). However, it does not teach coating with silicon carbide.
- c) '145 teaches coating of a carbon preform used as an integral crucible support. This coating is performed by CVD and uses either carbon or silicon carbide as the coating. (Column 6 Lines 46-66).
- d) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have combined the methods of '491 and '145 since both methods teach methods of making CVI-treated crucible supports.

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- e) '595 teaches that a graded composition of coating enhances the bond of the fiber to the matrix, producing a more durable preform (Column 2 Line 64 - Column 3 Line 3) and teaches a graded C-SiC coating (Column 5 Lines 26-46).
- f) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the method of '491/'145 to produce a graded coating as taught in '595, because '491/'145 wants to produce a densified carbon preform and '595 teaches that a graded densification produces a product with better adhesion of the densification material to the preform.

19) Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over '491 as applied to claim 15 above.

20) With regard to Claim 21, '491 teaches a method according to claim 15, except for the following limitation:

- a) The stabilized framework has a porosity  $p$ , where  $5\% < p < 95\%$ .
- b) The porosity of a densified material is a result effective variable with regards to the final density of the material, as air has a lower density than solid materials. Therefore, in two identical volumes of a given material with different porosity, the material with higher porosity will always have a lower density.
- c) '491 discloses the claimed invention except for the final porosity of the densified material. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to control the porosity of the material with regards to its intended end use, since it has been held that where the general



conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 105 USPQ 223 (CCPA 1955).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Michael G. Miller/  
Examiner, Art Unit 1792

/Michael Cleveland/  
Supervisory Patent Examiner, Art Unit 1792